

We claim:

1. A planar waveguide grating device, comprising:
a slab waveguide defining an input channel and a plurality of output channels; and
an echelle grating having a multitude of facets, each of said facets being blazed
5 with respect to a preselected channel position, and each facet having an elliptical
curvature so as to be astigmatic with respect to the input channel and said preselected
channel position.
2. A planar waveguide grating device as claimed in claim 1, wherein different
groups of facets are astigmatically blazed with respect to preselected sets of input channel
10 and blazing positions.
3. A planar waveguide grating device as claimed in claim 1, wherein said facets are
arranged such that the input and output channels lie on a Rowland circle.
4. A planar waveguide grating device as claimed in claim 1, wherein the input
channel and the preselected output channel are located at the foci of an ellipse along a
15 segment of whose locus the facets lie.
5. A planar waveguide grating device as claimed in claim 4, wherein said echelle
grating is configured to operate in at least the 20th order.
6. A planar waveguide grating device wherein said echelle grating is configured to
operate in at least the 450th order.
- 20 7. A planar waveguide grating device as claimed in claim 1, wherein is said slab
waveguide and said echelle grating form an integrated device.
8. A method of making a planar waveguide grating device, comprising:
providing a slab waveguide defining an input channel and a plurality of output
channels; and
25 forming an echelle grating having a multitude of facets, each of said facets being
blazed with respect to a preselected output channel, and providing each facet with an
elliptical curvature so that it is astigmatic with respect to the input channel and said
preselected output channel.

9. A method as claimed in claim 8, wherein said facets are located such that said input and output channels lie on a Rowland circle.

10. A method as claimed in claim 8, wherein the input channel and the preselected output channel are located at the foci of an ellipse along a segment of whose locus the facets lie.

5 11. A method as claimed in claim 8, wherein said echelle grating is configured to operate in at least the 20th order.

12. A method as claimed in claim 8, wherein said echelle grating is configured to operate in at least the 450th order

10 13. ~~12.~~ A method as claimed in claim 8, wherein said slab waveguide and said echelle grating are fabricated as an integrated device.

14 ~~13.~~ A method as claimed in claim 12, wherein said slab waveguide and said echelle grating are fabricated on a silicon wafer.

Rule 1.126
PCT Rule 6.2